



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/032,906	12/28/2001	Steven M. Penn	TI-30544	9017

23494 7590 07/19/2005

TEXAS INSTRUMENTS INCORPORATED
P O BOX 655474, M/S 3999
DALLAS, TX 75265

EXAMINER

FINEMAN, LEE A

ART UNIT PAPER NUMBER

2872

DATE MAILED: 07/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Period for Reply

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.

- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.

- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.

- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 January 2005.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 and 23-32 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13, 16-20 and 23-30 is/are rejected.
- 7) ☒ Claim(s) 14, 15, 31 and 32 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

This Office Action is in response to an amendment filed 21 January 2005 in which claims 1-17 were amended. Claims 1-20 and 23-32 are pending.

Specification

1. The disclosure is objected to because of the following informalities: On page 8, line 12, "an" should be --and--.

Appropriate correction is required.

Claim Objections

2. Claims 1-16 are objected to because of the following informalities:

In claim 1, lines 10-13 the antecedent basis of the projection path is confusing as written.

The examiner suggests the following changes to those line:

--a total internal reflection prism assembly on said illumination path and a projection path to separate the illumination and projection paths; and
at least one projection lens on [[a]] the projection path for focusing said first and second beams on an image plane.--

Claim 5 includes the limitation "comprising at least one prism in said illumination and said projection paths for separating said filtered illumination light beam and said modulated light beam." It is unclear whether this is a prism that would be included in the total internal reflection prism assembly or a different one. For the purposes of examination, it will be considered part of the total internal reflection prism assembly.

Claim 6 includes the limitations of a first and second prism. Again it is unclear whether these prisms that would be included in the total internal reflection prism assembly or are they different prisms. For the purposes of examination, they will be considered different than the total internal reflection prism assembly.

The dependent claims inherit the deficiencies of the claims from which they depend. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3, 5-6, 11-12, 16-19 and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii et al., US 5,552,840 in view of Poradish et al., US 5,612,753.

Regarding claims 1, 3, 5, 12, 17, 19 and 29, Ishii et al. teach an image display system (fig. 1) comprising: a light source (1) for providing a beam of light along an illumination path (fig. 1); a sequential color filter (13), which is a color wheel (fig. 4 and column 7, lines 16-22) on said illumination path for filtering said beam of light (fig. 1); a polarizing beam splitter (70) on said illumination path (fig. 1) for separating said filtered light beam into a first beam (a) having a first polarization state (S) and a second beam (b) having a second polarization state (P); a first spatial light modulator (12), which is a liquid crystal device (column 8, lines 29-30) receiving and selectively modulating said first beam (a); a second spatial light modulator (12') receiving

Art Unit: 2872

and selectively modulating said second beam (b), and at least one projection lens (5) on a projection path for focusing said first and second beams on an image plane (6). Ishii et al. disclose the claimed invention except for a total internal reflection prism assembly on the illumination and projection paths to separate the illumination and projection paths. Poradish et al. teach an image display system (fig. 3) that includes a total internal reflection prism assembly (reference 28) located on the illumination path from a light source (10) to a first and second spatial light modulator (30a and 30b) and on the projection path from the spatial light modulators to the projection lens (32) to separate the illumination and projection paths (fig. 3 and column 3, lines 33-43). It would have been obvious to one of ordinary skill in the art at the time of the invention to add the total internal reflection prism assembly of Poradish et al. into the image display system of Ishii et al. to provide proper illumination angles while allowing more flexibility in positioning of the element (see Poradish, column 5, lines 18-19 and fig. 3). The method of utilizing the structure of the claim is inherent therein.

Regarding claims 2 and 18, Ishii et al. further teach said polarizing beam splitter (70) combining said modulated first and second light beams (c).

Regarding claim 6, Ishii et al. further teach a first prism (72) in said illumination and said projection paths for separating said first beam directed to said first modulator and said modulated first beam from said first modulator; and a second prism (73) in said illumination and said projection paths for separating said second beam directed to said second modulator and said modulated second beam from said second modulator.

Regarding claim 16, Ishii et al. further teach polarized eyewear (column 5, lines 58-60) for a viewer of said image display system.

Art Unit: 2872

Regarding claims 11 and 28, Ishii et al. disclose the claimed invention except for said first modulator comprising a micromirror device. Poradish et al. teach modulators (30a and 30b) in an image display system (fig. 3) being micromirror devices (column 5, lines 53-54). It would have been obvious to one of ordinary skill in the art at the time of the invention to make the modulators of Ishii et al. be micromirror devices as suggested by Poradish et al. to reduce the amount of system hardware (Poradish, column 1, lines 60-63).

5. Claims 4 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii et al. in view of Poradish et al. as applied to claims 1 and 17 above, and further in view of Brennesholtz, US 6,285,415.

Ishii et al in view of Poradish et al. as applied to claims 1 and 17 above disclose the claimed invention except for a spiral color wheel. Brennesholtz teaches a spiral color wheel (column 3 lines 56 - 62) used to sequentially filter colors in a projection system. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a spiral color wheel of Brennesholtz in the image display system of Ishii et al in view of Poradish et al. in order to increase the efficiency of the image display system (Brennesholtz, column 2, lines 9 - 15).

6. Claims 7 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii et al. in view of Poradish et al. as applied to claims 1 and 17 above, and further in view of Lee, US 5,121,983.

Ishii et al in view of Poradish et al. as applied to claims 1 and 17 above disclose the claimed invention except for wherein the modulated light from said first modulator passes through a first projection lens and light from said second modulator passes through a second projection lens. Lee teaches the equivalency of image display systems wherein the modulated light passes through either one projection lens (K, fig. 3) or a first and second projection lens (K-1, K-2 in fig. 4). It would have been obvious to one of ordinary skill in the art at the time of the invention to have the modulated light of Ishii et al. in view of Poradish et al. pass through a first and second projection lens as suggested by Lee to provide more flexibility in left and right image positioning.

7. Claims 8-10 and 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii et al. in view of Poradish et al. as applied to claims 1 and 17 above, and further in view of Gibbon et al., US 2003/0020809.

Ishii et al in view of Poradish et al. as applied to claims 1 and 17 above disclose the claimed invention except for wherein said first and second modulators are positioned such that pixilated images from said first and second modulators are offset by approximately one-half pixel in both a horizontal direction and a vertical direction at said image plane.

Gibbon et al. teach two modulators positioned such that pixilated images from the modulators are offset by approximately one-half pixel in both horizontal and vertical directions at said image plane (page 1, paragraph [0012]). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the pixel arrangement of Gibbon et al in the

Art Unit: 2872

image display system of Ishii et al. in view of Poradish et al. in order to increase the image resolution (Gibbon, paragraph [0012], lines 9-14).

8. Claims 13 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii et al. in view of Poradish et al. as applied to claims 1 and 17 above, and further in view of Wang, US 6,097,456.

Ishii et al in view of Poradish et al. as applied to claims 1 and 17 above disclose the claimed invention except for a recycling integrator on said illumination path for homogenizing said light beam prior to said sequential color filter. Wang teaches a display system (Figure 1 reference 100) with a recycling integrator (reference 130) on an illumination path for homogenizing a light beam (column 3 lines 51 - 55) prior to a sequential color filter (reference 120). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the recycling integrator of Wang in the image display system of Ishii et al. in view of Poradish et al. in order to have uniform light illumination (Wang, column 3, lines 51 - 53).

Allowable Subject Matter

9. Claims 14, 15, 31, and 32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Claims 14, 15, 31, and 32 are have allowable subject matter over the prior art for at least the reasons stated in the office action mailed 21 September 2004.

Response to Arguments

10. Applicant's arguments with respect to claims 1 and 17 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Divelbiss et al., US 2003/0112507 A1 discloses an image display system with an integrator and color wheel. Van den Brandt, US 4,969,730 discloses an image display system with a prism assembly.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lee Fineman whose telephone number is (571) 272-2313. The examiner can normally be reached on Monday - Friday 7:30 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on (571) 272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2872

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



LAF

July 14, 2005



MARK A. ROBINSON
PRIMARY EXAMINER